Item 5
Supporting Document 2

Staff Report
for

Item 5
February 24, 2005

To: John H. Robertus
Executive Officer

From: Hashim Navrozali
Water Resource Control Engineer
Industrial Compliance Unit

Tentative Order Nos. R9-2005-0005 and R9-2005-0006
NPDES Permit Nos. CA0108073 and CA0108181

WASTE DISCHARGE REQUIREMENTS

FOR

SOUTHERN CALIFORNIA EDISON
SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 AND 3
SAN DIEGO COUNTY

BACKGROUND

San Onofre Nuclear Generating Station (SONGS) is a nuclear-fueled electrical power generating facility located in San Diego County immediately adjacent to the Pacific Ocean, approximately two and one-half miles southeast of San Mateo Point, within the boundaries of the United States Marine Corps Base, Camp Pendleton. SONGS is located in Section 24, T9S, R7W, SBBM, approximately two and one-half miles southeast of the City of San Clemente and approximately 12 miles northwest of the City of Oceanside. The two currently operational Units (Units 2 and 3) are owned by Southern California Edison (SCE), San Diego Gas and Electric Company (SDG&E) and the Cities of Anaheim and Riverside. SCE is, however, solely responsible for the operation of SONGS Units 2 and 3. Unit 1, located adjacent to Units 2 and 3, is no longer operational. Unit 1, like Units 2 and 3, was a nuclear-fueled electrical power generating facility. Unit 1 began commercial operation in 1968 and terminated power generation in November of 1992. SCE began formal decommissioning of the plant in September 1999.

Unit 2 has an electrical output of 1,087 MW and began operation in 1983. Unit 3 is virtually identical to Unit 2; it too has an electrical output of 1,087 MW and began operation on April 1, 1984. A series of large pumps pass 1,219 million gallons per day (MGD) seawater through the condenser of each Unit. Upon passage through the condenser, the temperature of seawater increases approximately 20ºF. During this circuit, a number of low volume in-plant waste streams are co-mingled with the cooling water flow. These include wastewaters from the following operations/processes:

- Blowdown Processing
- Makeup Demineralizer
- Radwaste System
- Polishing Demineralizer System
- Steam Generator Blowdown
- Hotwell Overboard
- Plant Drains
- Intake Structure Sump
- Thermophilic Digester
- Concrete Cutting Water

Most of the low volume in-plant waste discharges are periodic and only occur during unusual conditions such as maintenance outages.

The effluent from Units 2 and 3 is discharged to the Pacific Ocean via individual ocean outfalls (i.e. Outfalls 002 and 003). The point of discharge from Unit 2 is latitude 33° 21' 11.74" North, longitude 117° 34' 13.5" West. The point of discharge from Unit 3 is latitude 33° 21' 11.74" North, longitude 117° 33' 51.61" West. The outfalls use extensive diffuser structures several thousand feet in length, thereby maximizing mixing upon release to the ocean. The maximum permitted combined discharge of cooling water and in-plant wastestreams, through each outfall, is 1,287 MGD.

Unit 2 is currently subject to waste discharge requirements established by Order No. 99-47 (NPDES Permit No. CA0108073, adopted on August 11, 1999), which was preceded by Order No. 94-49 (adopted on August 11, 1994) and Order No. 85-11 (adopted March 4, 1985).

Unit 3 is currently subject to waste discharge requirements established by Order No. 99-48 (NPDES Permit No. CA0108181, adopted on August 11, 1999), which was preceded by Order No. 94-50 (adopted on August 11, 1994) and Order No. 85-12 (adopted March 4, 1985).

The existing Orders (Nos. 99-47 and 99-48) for Units 2 and 3 expired on August 11, 2004. Pursuant to 40 CFR Part 122.46, tentative Order Nos. R9-2005-0005 and R9-2005-0006, if adopted, will renew the NPDES permits for Units 2 and 3 for another five years and update the waste discharge requirements. Pursuant to 40 CFR 122.6, Order Nos. 99-47 and 99-48 will continue to be administratively enforced until the Regional Board adopts tentative Order Nos. R9-2005-0005 and R9-2005-0006.

The waste discharge requirements and monitoring requirements contained in both tentative Orders are virtually identical, since both Units 2 and 3 have the same electrical outputs (i.e. 1,087 MW), maximum discharge flow-rates (i.e. 1,287 mgd), and constituents in their effluent.

The effluent limitations for toxics and discharge prohibitions in the tentative Orders have been updated based on Table B of the 2001 California Ocean Plan. The effluent limitations for toxics in the existing Orders for Units 2 and 3 (i.e. Order Nos. 99-47 and 99-48) were based on the 1997 version of the Ocean Plan. The 2001 Ocean Plan (Section III.C.7.d) has special procedures for calculating effluent limitations for dischargers such as large power plants that use a large volume of ocean water for once through cooling. Based on the procedures outlined in the 2001 Ocean Plan, the tentative Orders specify concentration-based effluent limitations for the combined discharges from each Unit (i.e. cooling water discharge and in-plant wastestreams) and mass-based effluent limitations for combined in-plant wastestreams. This approach was also utilized in Order Nos. 99-47 and 99-48.

Other waste discharge requirements (including effluent and receiving water limitations, prohibitions, and monitoring requirements) contained in tentative Orders for Units 2 and 3 are based on the

federal NPDES regulations, the federal technological based standards for steam electric power plants (40 CFR 123), the provisions of Sections 316(a) and 316(b) of the Clean Water Act (CWA) (power plant intake structure and thermal discharge regulations), the State Thermal Plan, and the Basin Plan.

Order Nos. 99-47 and 99-48 include a Delta T limitation (i.e. incremental temperature of discharge above that of the intake water) of 25º F for discharges from Units 2 and 3. This limitation is also included in the tentative Orders. The 25º F Delta T limitation exceeds the 20º F limitation requirement of the Thermal Plan, but was permitted under a Thermal Plan exception that was granted to the Discharger by the State Board in April 1999.

Order Nos. 99-47 and 99-48 include a comprehensive receiving water monitor program that requires monitoring of physical, chemical, and biological parameters of ocean waters in the vicinity of Outfalls 002 and 003. The parameters include temperature (thermographs and profiles), dissolved oxygen, pH, turbidity (aerial photography), fish populations (trawling surveys), and kelp canopy coverage and densities. The receiving water monitoring for these parameters has been retained in the tentative Orders.

Pursuant to the Atomic Energy Act (AEA) all radioactive discharges and materials from SONGS are regulated by the Nuclear Regulatory Commission (NRC). The tentative Orders do not regulate radioactivity in the discharges from Units 2 and 3 since the U.S. EPA and the States do not have the authority, through the NPDES permit program, to control radioactive materials that are regulated under the AEA.

The tentative Orders do not authorize any new discharges. Furthermore, most of the effluent concentration and mass emission rate limitations in these Orders (including thermal Delta limitations and limitations for low-volume wastes) are the same or more stringent than those in Order Nos. 99-47 and 99-48. All monitoring frequencies and reporting requirements contained in the tentative Orders are also the same or more stringent than those in Order Nos. 99-47 and 99-48.

Although Unit 1 is currently being decommissioned and does not generate electricity, up to 37 MGD of seawater is utilized at Unit 1 to remove waste heat from the spent fuel pool and to dilute various low-volume waste streams still generated by the plant. SCE also operates a domestic wastewater treatment plant inside the Unit 1 premises. Up to 0.1 mgd of secondarily treated effluent is discharged from the treatment plant. The combined effluent from Unit 1 is currently discharged via an ocean outfall (i.e. Outfall 001) to the Pacific Ocean at latitude 33°21'43" north, longitude 117°33'46" west.

SONGS Unit 1 is subject to waste discharge requirements established by Order No. 2000-04 (NPDES Permit No. CA0001228, adopted on February 16, 2000). Order No. 2000-04 expired on February 16, 2005. SCE is permitted to discharge the effluent from Unit 1 to Outfall 001 or route the effluent to Outfalls 002 or 003. SCE has indicated that it plans to terminate the use of Outfall 001 sometime in 2005. At that time all effluent from Unit 1 will be routed exclusively to Outfalls 002 or 003. The Regional Board has determined that it would be appropriate not to renew the NPDES permit for Unit 1. Order No. 2000-04 will instead continue to be enforced administratively until such time that the Discharger notifies the Regional Board that it has terminated the use of Outfall 001. The Regional Board will consider rescinding Order No. 2000-04 at that time.

Tentative Order Nos. R9-2005-0005 and R9-2005-0006 acknowledge the impending termination of flows from Unit 1 to Outfall 001 and the routing of up to 37 MGD of flows from Unit 1 to Outfalls 002 or 003. Both tentative Orders are structured to account for effluent limitations and monitoring requirements as a result of the routing of Unit 1 flows to Outfalls 002 or 003. The total permitted flow through the Unit 2 and 3 outfalls shall, however, remain unchanged at 1,287 mgd. Furthermore, the concentration-based effluent limitations for the combined discharge through the Unit 2 and 3 outfalls shall also remain unchanged.

SUMMARY OF SIGNIFICANT CHANGES

Following is a summary of changes and new requirements that have incorporated into tentative Order Nos. R9-2005-0005 and R9-2005-0006, with respect to the current version of the NPDES permits (i.e. Order Nos. 99-47 and 99-48). As indicated earlier, the waste discharge requirements and monitoring requirements contained in both tentative Orders are virtually identical:

1. Effluent Limitations:

   Significant Changes:

   a. Effluent Limitations for Whole Effluent Toxicity in Combined Discharge
   The tentative Orders do not include acute toxicity limitations for discharges from Units 2 and 3. The tentative Orders do include chronic toxicity limitations which are consistent with 2001 Ocean Plan requirements.

   Section III.C of the 2001 Ocean Plan is ambiguous in appearing to require establishment of effluent limitations for both acute and chronic toxicity for all ocean dischargers but requiring only chronic and not acute toxicity monitoring when the minimum initial dilution of the effluent is below 100 to 1. Further, the Ocean Plan provides an equation for determining acute toxicity limitations, which allow for a mixing zone for the acute toxicity objective that is 10 percent of the distance from the edge of the outfall structure to the edge of the chronic mixing zone. The Ocean Plan states that this equation applies only when the minimum probable initial dilution is greater than 24 to 1. The Regional Board, in consultation with the SWRCB staff, has concluded that an acute toxicity limitation is not required for discharges from SONGS Units 2 and 3 through Outfalls 002 and 003, which receive a minimum probable initial dilution of 10 to 1. Because new information (the 2001 Ocean Plan) is available since adoption of Order Nos. 99-47 and 99-48, the elimination of acute toxicity limitations from that Order does not violate anti-backsliding prohibitions of the Clean Water Act. The tentative Order Nos. R9-2005-0005 and R9-2005-0006 do include chronic toxicity limitations, which are consistent with Ocean Plan requirements, and which are more meaningful than acute toxicity limitations for the high volume, dilute flows typical of Outfalls 002 and 003.

   b. Effluent Limitations for Toxics in Combined Discharge
   Order Nos. 99-47 and 99-48 did not include concentration-based, instantaneous maximum limitations for the combined discharge for cyanide, ammonia, non-chlorinated phenolic compounds, chlorinated phenolics, endosulfan, endrin, and HCH. Pursuant to the 2001 Ocean Plan, limitations for these pollutants are required for protection of marine

aquatic life. Concentration-based limitations for these compounds are included in the tentative Orders.

c. Effluent Limitations for Toxics in In-plant Wastestreams
In Order Nos. 99-47 and 99-48 the mass-based limitations for toxics (as listed in Table B of the 2001 Ocean Plan) in the combined in-plant wastestreams did not account for the potential routing of flows from Unit 1. In the tentative Orders, the mass emission limitations calculations for individual toxics account for the 1.38 mgd of in-plant wastes that could be routed from Unit 1to Outfalls 2 or 3.

2. Monitoring Requirements:

Significant Changes:

a. Total Chlorine Residual in Combined Discharge
The monitoring frequency for total residual chlorine in the tentative Orders has been increased from monthly to weekly.

Order Nos. 99-47 and 99-48 require total residual chlorine in the combined discharge to be monitored on a monthly basis. Although monitoring data for the last two years has not indicated any violations in the total chlorine residual discharge limitation, this monitoring regimen may be insufficient due to the intermittent nature of chlorination cycles (i.e. 4 cycles per day, 25 minutes per Unit per cycle).

b. Bacterial Monitoring for Receiving Waters
The tentative Orders discontinue the bacterial monitoring program for receiving waters.

Order Nos. 99-47 and 99-48, through Addendum No. 1, required the discharger to conduct coliform, fecal coliform, and enterococcus monitoring at two offshore and two surfzone receiving water stations in the vicinity of the SONGS Unit 1 outfall. At the offshore locations samples were required from the surface, mid-depth, and bottom. All sampling and bacterial analyses were required monthly, except from April 1 to October 31, when weekly sampling was required at one of the surfzone stations, the San Onofre State Beach.

In supplemental application materials submitted to the Regional Board for permit renewal on March 30, 2004, the discharger requested that bacteria monitoring at receiving water locations (as required by Order Nos. 99-47 and 99-48) be eliminated. A review of the bacterial monitoring data submitted by the Discharger indicates that that bacterial contamination is not a significant component of the discharge through Outfall 001 (where domestic wastewaters have been discharged in the past). To date, no samples collected in the vicinity of the Outfall 001 have shown elevated bacteria levels that exceed water quality criteria of the Ocean Plan. Infrequently elevated levels of enterococcus coliform bacteria found at near shore locations appear to be associated with storm water runoff and/or natural effects, such as rotting kelp. Because treated domestic wastewaters from the Mesa Complex and Unit 1 sewage treatment plants are diluted by 15 – 35 mgd, when discharged through Outfall 001, and would be diluted by at least 1,219 mgd, if discharged through Outfalls 002 or 003; and because bacteriological monitoring is already conducted

by the San Diego County Department of Health near the SONGS facility, tentative Order Nos. R9-2005-0005 and R9-2005-0006 do not include the receiving water bacterial monitoring program established by Order Nos. 99-47 and 99-48.

c. Offshore Transmissivity Monitoring
The tentative Orders discontinue the requirement for the Discharger to conduct periodic offshore transmissivity monitoring.

MRP Nos. 99-47 and 99-48 require the discharger to develop surface to bottom profiles of light transmittance on a quarterly basis at 29 receiving water stations. In supplemental application materials submitted on March 30, 2004, the discharger requested that transmissivity monitoring at receiving water locations be discontinued.

Monitoring of light transmittance during four separate oceanographic surveys in 2003 found no floating particulates, grease, oil, or noticeable discoloration of the sea surface attributable to the SONGS facility. Further, transmissivity monitoring in 2003 and aerial photographic surveys suggested that transmissivity in the study area was strongly related to station depth and natural turbidity effects, and not the result of generating station effects.

The Regional Board has reviewed study data from the offshore transmissivity monitoring program and in-plant studies on effluent turbidity and concurs with Discharger's assertion that the Units 2 and 3 discharges do not cause appreciable reductions in light transmission beyond the zone of initial dilution. The Regional Board finds that the Units 2 and 3 discharges are compliant with the Ocean Plan prohibition against such adverse discharges. Tentative Order Nos. R9-2005-0005 and R9-2005-0006 do not include the provision to conduct offshore transmissivity monitoring but retain the requirement for aerial photographic surveys of the discharge area.

3. New Requirements Pursuant to Clean Water Act (CWA) Section 316(b):

On July 9, 2004 the U.S. EPA published a final rule to implement Section 316(b) of the Clean Water Act. This rule, 40 CFR 125, Subpart J, *Requirements Applicable to Cooling Water Intake Structures for "Phase II Existing Facilities" Under Section 316(b) of the Act*, establishes location, design, construction and capacity standards, for cooling water intake structures at existing power plants that use the largest amounts of cooling water (i.e. greater than 50 MGD). The rule, commonly referred to as *Phase II*, became effective on September 7, 2004. SONGS Units 2 and 3 are subject to the requirements of the *Phase II* rule.

Section 125.94(b) of the *Phase II* rule establishes entrainment and impingement performance standards for intake structures. These performance standards include reducing impingement mortality of all life stages of fish and shellfish by 80-95 percent from the calculation baseline (i.e. without any control in place) and reducing entrainment mortality by 60-90 percent from calculation baseline. The alternatives include using existing technologies, selecting additional fish protection technologies (such as screens with fish return systems), and using restoration measures.

Pursuant to the *Phase II* rule, the tentative Orders include a requirement for the Discharger to perform a *Comprehensive Demonstration Study* that characterizes impingement mortality and entrainment, describes the operation of the cooling water intake structures at SONGS Units 2 and 3, and confirm that the technologies, operational measures, and/or restoration measures that the Discharger has selected or installed, or will install, meets one of the five compliance alternatives listed in Section 125.94(a) of the *Phase II* rule.

The tentative Orders require the Discharger to complete its *Comprehensive Demonstration Study* and submit a final report no later than January 9, 2008.

The Discharger is required to submit a *Proposal for Information Collection* prior to submittal of the *Comprehensive Demonstration Study*. The *Proposal for Information Collection* as required by Section 125.95(b)(1) of the rule will be due no later than 6 months after adoption of the Orders.

The provisions, compliance requirements, and compliance schedules for the Section 316(b) *Phase II* rule have been incorporated into the tentative Orders.

COMMENTS RECEIVED

As of February 24, 2004 one comment letter, from Mr. Sheldon Plotkin, has been received. Additional written comments received will be provided to Regional Board members in the supplemental agenda mailing, prior to the March 9, 2005 hearing.

After the close of the public comment period on March 9, 2005, the Regional Board will schedule a subsequent date for deliberating on all testimony and making a decision on the adoption of tentative Order Nos. R9-2005-0005 and R9-2005-0006. Staff will be preparing a response to comments document to address the written comments received and will be providing the document to Regional Board members and the public after the March 9, 2005 hearing. An Errata Sheet to the tentative Orders, if needed, will also be compiled. No additional written or oral testimony will be accepted after March 9, 2005, unless the Regional Board reopens the public comment period.